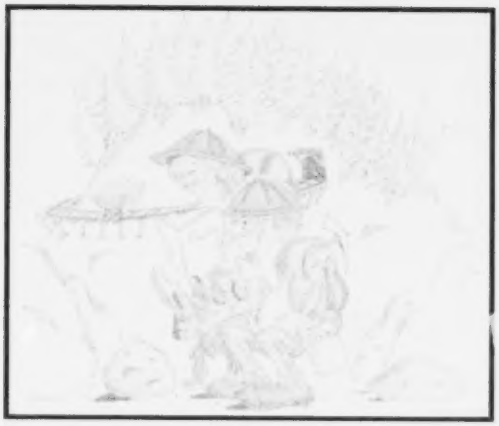

# ROCKHOUNDING

## IN SEARCH OF EARTH'S TREASURES!

BRITISH COLUMBIA

**Ministry of Energy and Mines**
Geological Survey Branch

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# QUESTIONS ABOUT ROCKHOUNDING

## What is a Rockhound?

A rockhound is defined as an amateur mineralogist, but really it's someone who enjoys collecting interesting rocks and minerals. The term rockhound includes people who casually pick up something that catches their eye and serious collectors who enjoy rock and mineral samples at rock and gem shows around the country.

## Who can be a Rockhound?

Anyone! If you've ever picked up an interesting-looking rock on a walk or at the beach, then you have already begun!

## Why be a Rockhound?

Because it's neat to build a collection of minerals and learn what they are and what they can tell us about the history of the earth and the creatures that have lived on it. A perfectly formed crystal is a beautiful thing, and there is always the possibility that you will make an important discovery that may end up on display in your local museum. Normally though, you'll be able to accumulate a collection that will draw the interest of all your friends.

## Where to be a Rockhound?

British Columbia is a great hunting ground for the collector. The geological forces which shaped our province also created many ideal settings for the formation of fascinating and valuable minerals.

# ROCKHOUNDING IS FUN!

Rockhounding is an activity that anyone can enjoy. Rocks are everywhere and you don't need much in the way of equipment to get started. Therefore, any family outing can easily be turned into a rockhounding expedition. Alternatively, rockhounding can be the focus of major wilderness hiking trips.

Once you start learning about rocks and minerals, you will be amazed at how interested other people are in what you can tell them. Everyone has an interest in the earth and a rockhound has the advantage of being able to satisfy some of that natural curiosity. Rockhounding can also lead into lapidary (the cutting and polishing of rocks and minerals) and jewellery making or perhaps into the scientific fields of geology, such as paleontology, mineralogy and petrology.

It's very satisfying to organize, catalogue, label and display specimens you've collected and identified yourself. Your collection will be unique and will continually grow and change as you go on collecting expeditions or trade samples with friends and other collectors.

# 8 WAYS TO MAKE ROCKHOUNDING FUN!

## Rockhounding is fun if you know what to take

Of course this will depend on how seriously you pursue your hobby. Obviously, if you are planning a three day hiking trip to a remote site, you will need all the gear necessary for such an undertaking. However, for an afternoon's collecting close to home you can get by with much less.

Here are some of the basic items you will need to get started:

- ✓ hammer: geologist's pick or a mason's hammer (not a regular claw hammer as this might chip when used on rocks)
- ✓ chisels: 1/2 inch and 1 inch size
- ✓ day pack: to carry tools, specimens and lunch
- ✓ plastic bags: to hold samples
- ✓ newspaper: to wrap samples. Fragile samples can be wrapped in toilet paper or paper towels and small samples can be stored in egg cartons.
- ✓ safety glasses: goggle-type are best, but some plastic sunglasses can double as safety glasses
- ✓ notebook, pencils and marking pen
- ✓ appropriate clothing, rain gear and sturdy shoes or boots

You may also want to consider taking some of the following items along:

- ✓ hand lens: can be carried on a string around the neck and is invaluable for looking at details
- ✓ gloves: some rocks can have sharp edges
- ✓ hardhat: if you are going in or near quarries, steep banks or cliffs
- ✓ extra tools: sledgehammer, wedges, screwdriver, gardening tools, pry bar, rake and screen, pointed shovel
- ✓ extra maps: detailed maps of geology, topography, etc.
- ✓ altimeter: if you are offroad, this will help fix your position on a topographical map
- ✓ survival kit: the same kit as you would carry for an extended hike
- ✓ map and compass: if you are venturing off the road or trail
- ✓ geological guidebooks and geological maps
- ✓ mineral and rock identification kit (see pages 7 and 24)

# 2

## Rockhounding is fun if you know where to look

Geologically, British Columbia is very diverse. This is because it's actually made up of a lot of micro-continents that have become welded onto the edge of North America over hundreds of millions of years. This also partially explains the province's ruggedness. Because of the diversity of rock, the potential for mineral occurrences in British Columbia is immense. Because of the ruggedness, much of the province has not been adequately mapped or prospected. Thus, British Columbia is a frontier for Rockhounds with countless exciting sites waiting to be discovered.

The potential for mineral and rock collecting exists anywhere that rocks are exposed. Rocks commonly outcrop along steep hillsides, in gullies, river and stream beds, road cuts, building excavations and quarries. Even where there is no solid rock, minerals may be picked up from debris slopes, gravel deposits (river gravels and glacial deposits), old mine dumps, beaches (lakes and the ocean), and arid areas such as dried lake beds.

If you're collecting on private land make sure you have the owner's permission. If you're going on public land check to see if you need a permit. Disturb things as little as possible. Close gates behind you, do not interfere with livestock and fill in any large excavations you make.

DO NOT TRESPASS!

# 3

## Rockhounding is fun if you can take your treasures home

The easiest specimens to find are the ones that have already weathered out of the rock. Always look around on the ground to see what's there, it can sometimes save you a lot of hammering.

Many good samples will not be as easy to obtain and you will have to dig them out of the rock. Never try to pry your sample directly out of the rock, it's much better to take some of the surrounding rock as well. This will protect the mineral and allow you more flexibility in designing your displays.

Use the natural planes of weakness in the rock. Look for cracks and drive in a wedge or chisel. Work around the sample, but not too close or it might fracture. Take more rather than less, you can always remove the excess later. Be patient, the mineral has probably been in the rock for millions of years; it might take a while for you to get it out.

# 4

## Rockhounding is fun if you know what you found

Different minerals have different properties and these can be used to identify them. Often you will collect a mineral without knowing what it is. Identification will have to wait until you get home and can study it at leisure. But, the more minerals you collect, the better you will become at identifying them. Some of the properties used to identify minerals are colour, streak, form, cleavage, lustre, density, hardness, magnetic response and reaction with acid. There are many books in your local library which will provide you with the information you'll need to understand and use these properties.

It's easy to put together a small rock and mineral identification kit that will fit in your pack or pocket (see page 24). You will need:

- ✓ hand lens: 10 or 15 power with a wide field of view.
- ✓ penknife: As well as being useful for digging into soft rocks, this is useful for determining hardness.
- ✓ streak plate: Minerals often leave a streak when scratched on a small, white, non-glossy ceramic tile. This streak can be different from the mineral's colour and is useful in identification.
- ✓ dilute (5%) muriatic acid (HCl): This should be carried in a small, leak proof plastic dropper; otherwise it will rot your clothes!
- ✓ guide book: A good mineral identification book, listing the properties of the minerals you are likely to find (see the list of books given on page 14).
- ✓ magnet

# 5

## Rockhounding is fun if you can remember where you found your specimens

Even the most extraordinary mineral treasure cannot remind you where you found it. The first step when you find a specimen is to label and record where it came from. First you need to create a number for it. This should be systematic, perhaps using your initials, the date and a locality code. Then you have to mark the number on the sample. Sometimes this can be done with masking tape and a marker or a piece of paper can be put in the sample bag. In either case the bag itself should also be marked.

In your notebook, you should record the same sample number, plus an identification (if you know it at the time) and the date, location, and a description of the rock in which you found the mineral.

After you get home, you should clean your specimens. Excess rock can be carefully chipped off. Old dental tools are good for detailed work. Dirt can be washed off with soapy water and a toothbrush and a permanent label attached. A good way to label your minerals is to paint a small white strip in an inconspicuous place and write your sample number on the white paint.

The permanent sample number should be written on a card or in a catalogue along with the information from your field book and whatever else you have been able to find out about the specimen. The specimen can then be stored in a drawer or displayed for all to see.

# 6

## Rockhounding is fun if you know how minerals form

Finding a rock exposure is only the first step in Rockhounding. It helps to know what kinds of minerals you are likely to find in different types of rock.

Firstly, minerals need space to grow. The chemical, physical and temperature conditions might be just right, but if there's no room for a crystal to grow it won't form. Cavities are found in all rock types. Sometimes they are related to the rock itself (such as the gas bubbles which form in a cooling lava, or hollow concretions and nodules in sediments), or they may be the result of something which happened after the rock formed (cracks and fissures due to faulting and folding).

Veins and dikes are prime hunting-ground for mineral specimens. Both form as sheet-like bodies cutting other rocks and commonly contain larger than normal crystals, or may be composed of a single valuable mineral. The forces which create veins and dikes may result in cavities which can later fill with good mineral crystals.

# 7

## Rockhounding is fun if you know what rocks to look at

All rock types have the potential to contain interesting mineral specimens. However, different rocks contain different minerals and knowing which is which allows you to use geological maps and to zero in on areas that are likely to be interesting.

Igneous rocks are formed by the crystallization of molten material (magma) from deep within the earth. If the magma reaches the surface it cools quickly, forms small crystals and is termed extrusive (e.g. basalt lava). If the magma does not reach the surface it cools slowly, forms large crystals and is termed intrusive (e.g. granite).

Pegmatite is a good example of an intrusive igneous rock. It commonly occurs as dikes associated with granitic rocks and generally consists of large crystals of quartz, feldspar and biotite, however, some pegmatites also contain large crystals of tourmaline, beryl, garnet, spodumene, fluorite and muscovite. Pegmatites occur near Kootenay Lake, Blue River, Canal Flats, Revelstoke and many other places in British Columbia.

Basalt is an extrusive igneous rock. It commonly contains cavities resulting from gas bubbles which were trapped as the rock cooled. These cavities (amygdules) may contain agate, quartz, amethyst, chalcedony, calcite and zeolites. When the mineralized cavities weather out they are called geodes or thunder eggs. Basalts may be easily found around Kamloops, Princeton, Fort St. James and on Vancouver, Quadra, Texada and Lasqueti Islands.

Sedimentary rocks are formed by the compaction of sediments such as sand, gravel or clay, or by chemical precipitation to form rocks such as chert or travertine.

Chert and jasper are found on Vancouver Island, and around Keremeos, Kamloops, Ollala, Barriere, Cassier, Kaslo, Fort Fraser and

Williams Lake. Rhodonite is sometimes also found at these locations. Travertine occurs in limestones near Clinton, Lillooet, North Bend and Chilliwack. Gypsum forms chemically in sediments and can be found at Windermere, near Osoyoos and around Fort St. John.

Metamorphic rocks are formed by the alteration of already existing rocks, either igneous or sedimentary. High pressures and/or temperatures usually bring about the changes in mineralogy. The minerals present in metamorphic rocks depend upon the original rock type.

Metamorphosed ultramafic rocks may alter to serpentinite which can be associated with jade, soapstone, rhodonite, idocrase and chalcedony. Jade is found at Cassiar, Kutcho Creek, Dease Lake, Ogden Mountain and in the Bridge River area.

Marble is metamorphosed of limestone and may contain garnet, scapolite, tourmaline, epidote and wollastonite. Schists and gneisses may contain garnet, staurolite, sillimanite, andalusite, kyanite, rutile, corundum and spinel. Collecting areas include Kinbasket Lake, Vernon and Kootenay Lake.

These are by no means all the minerals found in the rocks of British Columbia. Use the publication list on pages 14 and 15 or talk to a geologist in the B.C. Geological Survey Branch (see page 16) to discover what can be found in your area.

# 8

## Rockhounding is fun if you are NOT in the hospital

Old mine sites, quarries and gravel pits are potentially dangerous places. There can be shafts and holes hidden by vegetation, cliffs and mined slopes that are unstable and likely to collapse, and complex underground tunnels filled with poisonous gases. Always be aware of the possible dangers around you.

Never enter these old workings to collect minerals and always let someone know where and when you're going on rockhounding expeditions. You should always collect with a friend!

Even if your surroundings seem safe, LOOK UP!

- ✓ Are there any loose rocks which your hammering might bring down?
- ✓ Watch for rockfalls and never walk directly above or below another person on a slope.

Check your hammer.

- ✓ Does the head look like it is about to fly off and injure you or your buddy?
- ✓ Always hammer away from yourself.
- ✓ Are you wearing your safety glasses?

Always carry a first aid kit and learn what to do if you or someone with you gets hurt.

If you're going into the backcountry, learn how not to get lost, learn what to do if you DO get lost and learn basic wilderness survival.

- ✓ Follow obvious geographical features (ridges, creeks, rivers) which take you in the right direction.
- ✓ Keep a mental note of landmarks you pass (a fallen tree, the number of creeks crossed).

- ✓ Trust your compass.
- ✓ If possible, talk to someone who has recently been where you plan to go.
- ✓ Let someone know where you're going and check in with them when you are safely back.
- ✓ Avoid getting wet unnecessarily.

Know how to react to any wild animals you may meet.

Carry emergency gear, dress appropriately, check the weather and allow enough time for all you want to do.

# SOME SOURCES OF INFORMATION

## Rock and mineral identification

The pictures in the following books show exciting examples of each mineral, but not necessarily the way you will find them. However, they do list all the properties of each mineral which will help you to make an accurate identification. Most are available in your local library or through your bookstore.

A Field Guide to Rocks and Minerals
by F.H. Pough (The Peterson Field Guide Series).

The Larousse Guide to Minerals, Rocks and Fossils
by W.R. Hamilton, A.R. Wooley and A.C. Bishop.

The Audubon Society Field Guide to North American Rocks and Minerals
by C.W. Chesterman.

## Books of particular interest

Rockhounding and Beachcombing on Vancouver Island
by Bill and Julie Hutchison (1975), Tom and Georgie Vaulkhard, The Rockhound Shop, Victoria, B.C.

Collecting Minerals
by Bill Ince (1977), McClelland and Stewart Limited, Toronto.

Guide to Rocks and Minerals of the Northwest
by Stan and Chris Leaming (1986), Hancock House, Surrey B.C.

The Agates of North America
by Hugh Leiper (1961), The Lapidary Journal, Del Mar, California.

Treasure Hunting in British Columbia
by Ron Purvis (1971), McClelland and Stewart Limited, Toronto.

Rock and Mineral Collecting in British Columbia
by S. Leaming (1973), Geological Survey of Canada Paper 72-53.

Rocks and Minerals for the Collector–The Alaska Highway; Dawson Creek, British Columbia to Yukon/Alaska Border
by Ann P. Sabina (1973), Geological Survey of Canada Paper 72-32.

## Selected publications

Information Motherlode–Geological Source Material for B.C .

This publication lists B.C. Museums, Gem and Lapidary Clubs and Mineral and Lapidary Dealers. Information Circular 1991-7; free on request from the B.C. Geological Survey Branch.

Introduction to Prospecting

by E.L. Faulkner, B.C. Ministry of Energy, Mines and Petroleum Resources, Paper 1986-4.

The Identification of Common Rocks

by E. Van der Flier-Keller and W.J. McMillan (1987), B.C. Ministry of Energy, Mines and Petroleum Resources, Information Circular 1987-5.

## Provincial and Federal Government Organizations

The Geological Survey Branch of the B.C. Ministry of Energy, Mines and Petroleum Resources is a good resource for anyone interested in the geology of the province. Their publications are distributed by:

Crown Publications Inc.
546 Yates Street
Victoria, B.C. V8V 1K8
Phone: (604) 386-4636
Fax: (604) 386-0221

B.C. and Yukon Chamber of Mines
840 West Hastings Street
Vancouver, B.C. V6C 1C8
Phone: (604) 681-5328
Fax: (604) 681-2363

Topographic maps and air photos are available from:

Maps B.C.
Surveys and Resource Mapping Branch
Ministry of Environment, Lands and Parks
1802 Douglas Street
Victoria, B.C. V8V 1X4
Phone: (604) 387-1441
Fax: (604) 387-3022

The Ministry of Tourism (Victoria) publishes a list of clubs and dealers in the province. They also publish:

Gem Hunting and Gold Panning
British Columbia Product Guide No. 19 (updated every year)

Rock and Mineral sets are available from the
B.C. Museum of Mining at Britannia Beach Phone: (604) 896-2233.

General information on the geology in your area may be obtained from any B.C. Ministry of Energy, Mines and Petroleum Resources' (MEMPR) Government Regional Geologist's office or from the Geological Survey Branch in Victoria.

PRINCE GEORGE
MEMPR-Regional Geologist
1652 Quinn Street
Prince George, B.C. V2N 1X3
Phone: (604) 565-6125

CRANBROOK
MEMPR-Regional Geologist
1113 Baker Street
Cranbrook, B.C. V1C 1A7
Phone: check local listings

KAMLOOPS
MEMPR-Regional Geologist
#200, 2985 Airport Drive
Kamloops, B.C. V2B 7W8
Phone: (604) 828-4566

SMITHERS
MEMPR-Regional Geologist
Bag 5000
Smithers, B.C. V0J 2N0
Phone: (604) 847-7391

VANCOUVER
MEMPR-Regional Geologist
Mineral Titles Branch
Room 301, 865 Hornby Street
Vancouver, B.C. V6Z 2G3
Phone: (604) 660-2672

VICTORIA
Geological Survey Branch
5th Floor
1810 Blanshard Street
Victoria, B.C. V8V 1X4
Phone: (604) 952-0382

## Societies

The best way to learn is to join a Rockhounding club if there is one in your area. The people in these clubs will share the same interests and will be glad to help you get started. They may even run organized trips to nearby localities.

Mineral hobby magazines (Canadian Rockhound, Lapidary Journal, Gems and Minerals) are also good sources of information. Local lapidary and gem dealers are often collectors themselves and museums have collections of rocks and minerals to examine.

Publications of the Gem and Mineral Federation of Canada are available from affiliated clubs and societies or from:

Maxine Lewis (secretary)
3492 Dundas Street
Vancouver, B.C. V5K 1R8

A complete list of affiliated clubs in B.C. can be obtained by writing to:

The Lapidary, Rock and Mineral Society of B.C.
941 Wavertree Road
North Vancouver, B.C. V7R 1S4

# GLOSSARY OF GEOLOGIGAL TERMS

| | |
|---|---|
| agate | A translucent, extremely fine-grained variety of quartz which is characterized by colours arranged in alternating bands, in irregular clouds or in moss-like forms. Usually forms in vugs or cavities in volcanic rocks. |
| amethyst | A pale purple-to-violet variety of crystalline quartz. The colour is due to iron compounds. |
| amygdule | A gas cavity or vesicle in an igneous rock which is filled with secondary mineral such as quartz, calcite, chalcedony or zeolite. An agate pebble could be referred to as an amygdule. |
| andalusite | A brown, yellow, green, red or grey mineral which occurs in thick, nearly square prisms in schists, gneisses and rocks altered by heat and pressure. |
| arid area | Areas, such as deserts, which have little or no rainfall. |
| basalt | A general term for dark coloured volcanic rocks composed chiefly of the minerals plagioclase and clinopyroxene. |
| basalt lava | Basaltic rocks which are formed as lavas on the earth's surface. |
| beryl | A green or bluish-green mineral which includes the varieties known as emerald, aquamarine, heliodor and golden beryl. |
| biotite | A common and important rock-forming mineral which belongs to the mica group of minerals. It is generally black or dark brown and has a characteristic platy form and can be split into very thin, transparent layers with a fingernail or sharp knife. |
| calcite | A common rock-forming mineral, $CaCO_3$. It is usually white or colourless and is very soft. Calcite usually fizzes in weak hydrochloric acid (muratic acid) and this is a test used by geologists to see if a mineral is calcite. |
| cavities | Small, usually rounded openings found in volcanic or sedimentary rocks. Frequently cavities may be filled with quartz or calcite to form geodes or nodules. |
| chalcedony | A very fine grained, or cryptocrystalline, type of quartz which forms concretionary (rounded) masses. Chalcedony is contained in most chert. |
| chemical precipitation | A process by which molecules are deposited out of fluids to form rocks or minerals. Agates and cherts are commonly thought of as chemical precipates. |

| | |
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| chert | A dark, extremely dense very fine grained, or cryptocrystalline, sedimentary rock consisting dominantly of quartz, usually the chalcedony variety. |
| cleavage | The crystal planes of a mineral along which it tends to break. |
| concretion | A hard compact mass or aggregate of mineral matter which is normally rounded but may be very odd shaped. They are usually formed by chemical precipitation. |
| corundum | A very hard mineral composed of aluminum and oxygen, $Al_2O_3$, which is used as an industrial abrasive. Gem varieties include ruby and sapphire. |
| crystal | A solid body of a single chemical element or compound which has a regular shape and which has a surface defined by flat faces. Quartz, emeralds and diamonds are naturally occurring minerals which form crystals. |
| debris slope | This is the material at the base of a high cliff or slope which is composed of fragments and boulders of the rocks and minerals which have been weathered from the cliff face above. May also be referred to as a talus slope. |
| dried lake bed | Material composed of lake sediments which is left after lake waters have evaporated or drained off. Salt is a common mineral which forms in the beds or sediments of a lake which dries up. |
| epidote | A yellowish-green mineral which commonly occurs in limestones which have been metamorphosed, or altered by heat. |
| excavation | Trenches, adits, pits and other workings created by prospectors, miners or Rockhounds to dig out interesting minerals or rocks. |
| extrusive | This is a molten rock which is forced out on to the surface of the earth to cool. An intrusive rock, on the other hand, is one which cools from a magma stage to a hard rock somewhere below the earth's surface. |
| faulting | Flat or planar features along which the earth's crust breaks and moves. Earthquakes are normally caused by movement of one rock against another along a fault. |

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| folding | Although most people don't realize it, rocks are quite plastic over hundreds of thousands of years. The normal movement of the earth's crust results in much pressure which in many cases will fold rocks. Much the same thing happens if you take a blanket, lay it flat on a floor and then push one edge towards the other with your hands–the blanket folds in a short time; rocks do the same over thousands or millions of years. |
| feldspar | Feldspars are the most common, rock-forming minerals and constitute 60 percent of the earth's crust. They include gem varieties such as labradorite and they weather over time to produce clays. |
| fissure | A surface or crack in the rocks along which there is a distinct separation. Fissures commonly result from movements caused by earthquakes. Old fissures are commonly filled with minerals such as quartz and calcite. |
| fluorite | A transparent to translucent, relatively soft, mineral found in many different colours. It is commonly found in association with ores of lead, tin and zinc metals and it may occur in large enough masses to be carved of ornamental objects. |
| garnet | Garnet is a name for a group of very similar minerals, including varieties known as almandine, andradite. It is usually red or orange in colour and is commonly used as an abrasive. Large garnets, particularly dark red ones, may be cut as semi-precious stones; a variety called pyrope is a beautiful mauve to purple colour and is commonly associated with diamond deposits. |
| gem | Any rough natural material that can be fashioned into a jewel. |
| geode or thunder eggs | A hollow, or partially hollow, rounded body. They are normally found in limestones and are characterized by an outer layer of dense chalcedony and an internal cavity which may be partly or wholly filled with inward-projecting crystals. |
| Geological Survey Branch | A part of the British Columbia Ministry of Energy, Mines and Petroleum Resources which carries out geological mapping and scientific research. Information collected by the geologists who work for the branch is used for environmental, land-use and mineral development activities in the province. |

| | |
|---|---|
| geology | The study of the earth and planets, the materials of which they are made, the processes that act on these materials, the products formed, and the history of the planet and its life forms. |
| glacial deposits | Material which was laid down as sediments or debris by glaciers. This normally includes gravels and sands. |
| gneisse | A banded, or foliated, rock formed by heat and pressure. |
| granite | A term loosely applied to any light-coloured, coarse grained plutonic rock containing quartz, as a major component, with feldspar and dark minerals. Plutonic rocks are those which cool beneath the earth's surface over a long period of time and which therefore tend to be composed of coarse sized mineral crystals. |
| gullies | Depressions formed in the landscape by streams and creeks eroding soils, gravels and surficial sediments. |
| gypsum | The commonest sulphate mineral, $CaSO_4.2H_2O$. Frequently associated with halite (salt) and anhydrite in evaporites (sediments formed by evaporation of water). Gypsum is very soft, white or colourless but commonly has grey, red or brown tints. It is used to make plaster of paris. |
| idocrase | Idocrase, or vesuvianite, is a brown, green or yellow mineral found in limestones which have been "baked" by hot intrusive rocks. Also known as "California Jade." |
| igneous rocks | Rocks which are formed by molten magma either at or below the earth's surface. |
| intrusive | Rocks which intrude or cut across other rocks. They normally "intrude" these other rocks as molten magma and then cool to form volcanic or plutonic rocks. |
| jade | A hard, extremely tough, gemstone consisting of the pyroxene mineral jadeite, or the amphibole mineral nephrite. May range in colour from dark-to-deep green to a dull or greenish white. It takes an excellent polish and is used for jewelry and carved articles. "California Jade" is a compact form of vesuvianite. |
| jasper | A variety of chert associated with iron ores. Characteristically red but yellow, green, brown and black varieties are known. |
| kyanite | A blue or light green mineral which occurs in long, thin, bladed crystals in schists, gneisses and granite pegmatites. |

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| lava | Hot, molten rock which has been forced out upon the surface of the earth and which normally flows like molasses downhill . |
| limestone | A sedimentary rock consisting chiefly of calcium carbonate. Limestones are formed by a variety of processes. Most notably they are created by the organisms which build coral reefs in relatively shallow ocean waters. |
| lustre | The reflection of light from the surface of a mineral described by its quality and intensity. Terms such as metallic or resinous, bright or dull may be used to describe the lustre of a mineral. |
| magma | Rocks which are molten liquid due to high heat and pressure. |
| marble | A metamorphosed limestone in which the calcium carbonate has become crystallized and will polish well. |
| metamorphic rocks | Rocks which are changed by pressure, temperature or chemicals to form new types of rocks. This normally means that the minerals which compose one rock type are recrystallized to form new minerals. |
| micro-continent | A small, independent group of rocks which may be transported and welded onto a larger continent. British Columbia is composed of many "micro-continents" which have been attached to the western edge of North America. Modern-day examples could be Vancouver Island or the Queen Charlottes which are being transported towards the mainland and (in several million years) will actually become part of it. |
| mine dump | The waste rock, or gangue, left over from a mining operation. Usually the ore, or mineral of value, is extracted from the rocks and the waste is piled up as a mine dump, or tailings. |
| mineralogist | A geologist who specializes in the study of minerals. |
| mineralogy | The study of rock forming minerals. |
| mineral | A naturally occurring, inorganic element or compound having an orderly internal structure and characteristic chemical composition, crystal structure, and physical properties. |
| muriatic acid | This is a common term for hydrochloric acid. |
| muscovite | A member of the mica family of minerals. It is similar to biotite. |

| | |
|---|---|
| nodule | A fragment of a coarse-grained igneous rock which is enclosed within another extrusive or intrusive igneous rock. |
| outcrop | A geologist's term for the area in which rocks are exposed at the earth's surface. |
| paleontology | The study of life and its environments in past geologic time based on fossil plants and animals. |
| pegmatite | Very coarse grained plutonic rock similar to granite in chemistry but characterized by very large mineral crystals. Some pegmatites have feldspar, quartz or other mineral crystals up to a metre or more in size. |
| petrology | A branch of geology which deals with the origin, occurrence, structure, and history of rocks. |
| properties | The characteristics of rocks or minerals by which they may be identified. |
| prospected | The process or activity by which a geologist or prospector examines and evaluates an area for valuable minerals. |
| pry bar | A crow-bar which can be used to free minerals from their host rocks. |
| quartz | An important rock-forming mineral composed of silica. |
| rake | Rake or pitch is the angle between the horizontal and any linear feature along the direction of the linear feature. |
| rhodonite | A pale-red or rose-red mineral of the pyroxenoid group of minerals. It is commonly used as an ornamental stone and polishes well. |
| road cuts | An excavation along or through a hill which is used to build a road. |
| rock identification kit | A kit composed of the tools and materials needed to test rocks and minerals to determine their properties. Typically such a kit would include a knife, a streak-plate, weak hydrochloric acid, a magnifying lens and a magnet (see page 7). |
| rutile | A reddish-brown mineral which commonly occurs in quarts (e.g., rutillated quartz). In large concentrations it may be an ore of titanium. |
| schist | A strongly foliated crystalline rock which can be readily split into flakes or slabs. |
| sedimentary rock | A rock which has resulted from the consolidation of loose sediment that has accumulated in layers. Examples are sandstone, shale, conglomerate and siltstone. |

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| serpentine | A group of rock-forming minerals which have a greasy or silky luster, a soapy feel and which are usually dark green to black in colour. |
| sillimanite | A mineral which occurs in long, slender needle-like crystals. |
| soapstone | A metamorphic rock composed essentially of talc which is used extensively for carvings and jewellery. |
| spinel | A very hard, gemstone. Varies widely in colour from colourless, to purple-red, green and black. |
| spodumene | A white-to-green prismatic mineral which may occur as very large crystals in pegmatites. |
| staurolite | A brown-to-black mineral crystal. Twinned crystals are common and form the shape of a stubby cross. |
| streak | The characteristic colour a mineral leaves when rubbed across a streak plate (a streak-plate is a white, non-glossy, ceramic tile). |
| topographical map | A map of an area showing the hills and valleys by using 'topographic contour lines.' It usually also contains much information on roads, rivers, towns and other features you may come across in a given area. |
| topography | The general shape of the surface of the earth, particularly used to define to the shape of the hills and valleys. |
| tourmaline | A dark brown-to-black mineral which occurs as 3, 6 or 9-sided, elongated prisms. The prisms are characteristically striated along the long axis of the crystals. |
| travertine | A dense, finely crystalline limestone which may be white, tan or cream in colour. Usually formed around hot springs or in limestone caves. A less compact variety is called tufa. |
| vein | A thin, sheet-like fracture in a rock which is filled with secondary minerals such as quartz or calcite. |
| wollastonite | A metamorphic mineral found in altered limestones. |
| zeolite | A large group of white or colourless hydrous aluminosilicate minerals. Commonly fill cavities in basalt lavas. |

NOTES